Examining the Relationship Between Psychological Ownership and Knowledge Sharing

A thesis submitted to the faculty of the University of Minnesota by

Harry L. Kohn

University of Minnesota Duluth

in partial fulfillment of the requirements for the degree of Harry L. Kohn Master of Arts

Dr. Alexandra Luong

June, 2018

Table of Content

List of Tables

Abstract

The purpose of this study was to understand psychological underpinnings that impede knowledge sharing. The relationships between psychological ownership (PO) and knowledge sharing intention and behavior were examined using a sample of university professors. Multiple regression analysis yielded a significant relationship between PO and knowledge sharing intention but not behavior. Employee attitudes were examined as moderators of this relationship; results showed job satisfaction moderated the relationship between PO and knowledge sharing.

Background

There are five extabytes of information created every two days (Gantz & Reinsel, 2011). To bring this claim to a comparative scale, one can think of the difference between a gigabyte and extabyte as roughly the difference between a person and the diameter of the sun. As further indication of the growth rate of information, human knowledge is at the point where it is doubling every 13 months and will likely expand in an exponential upward trend (Cole, Cox, Mackey, & Richardson, 2006). In the future, when specialization becomes more necessary due to the sheer quantity of knowledge, the ability to solve complex tasks requires individuals sharing knowledge outside their specialization, domain, or field (Ren, Carley, & Argote, 2006).

The importance of knowledge sharing within dyads, teams, and larger collectives has made it an area of research high in demand. Knowledge sharing behaviors are a focus of applied psychological research funded by NASA in communication, teamwork, and decision-making among distributed flight crew teams with highly specialized individuals (Caldwell, 2005). The sharing of ones' experiential resources with the team is a fundamental conduit through which all collective objectives are completed, which places a premium on knowledge sharing behaviors. Yet, the sharing of knowledge by an individual with team members can be impeded by a variety of factors. This study identifies and expounds on components of knowledge sharing in an organizational setting, specifically, the feelings of knowledge being identified as *mine* (psychological ownership) and the consequences of this construal on knowledge sharing.

Knowledge Sharing

Unpacking knowledge. As pointed out in a comprehensive review by Wang and Noe (2010), there has been no collective effort from researchers to arrive at a consensus regarding the

distinctions between information and knowledge. Nonaka (1994) posits a hierarchical relationship between the two, wherein information is a flow of messages or meanings that work as a feedback loop to inform knowledge. Knowledge itself, on the other hand, is identified as the output of information flow, anchored or biased by the beliefs of the individual (Nonaka, 1994). Some other researchers identify a syllogistic relationship between the two, as such all knowledge is identified as information, but not all information is identified as knowledge; knowledge includes information and know-how (Kogut & Zander, 1992). Others in the literature have used the terms interchangeably, citing little practicality in distinctions between the terms (Alavi & Leidner 2001; Bartol & Srivastava, 2002). This paper will construe both information and knowledge as including ideas, facts, expertise, and judgments relevant for the individual and team. Within this paper, the sharing of experiential resources is synonymous with knowledge sharing.

Operational definition of knowledge sharing. The operational definition of knowledge sharing from Usoro, Sharratt, Tsui, and Shekhar (2007) and subsidiary scale can be understood in the framework of a communicative process between a source transferring knowledge and a recipient's acquisition and interpretation of that knowledge. These authors define knowledge itself through cognitive machinations of data framed into meaningful contexts by an individual. The output of knowledge sharing is the creation of new knowledge by the recipient.

Measuring knowledge sharing. The question arises of how one quantifies knowledge sharing. While frequency of engagement is often used to measure specific behaviors (Yoo, Suh, & Lee, 2002), others argue for a more rigorous measurement with a higher degree of content validity to capture a construct as intangible as knowledge sharing. A multifaceted construal of knowledge sharing allows for previously unseen dimensions to become defined and quantifiable.

Usoro and colleagues (2007) quantify knowledge sharing behaviors in such a multifaceted way. Frequency, while indicative of an individual's engagement in knowledge sharing and an organization's culture of knowledge sharing, does not capture the value of the knowledge being transferred (Usoro et al., 2007). For example, inconsequential knowledge transfer such as commonly known knowledge between the source and recipient is not separated from new, meaningful, and impactful knowledge internalized by the recipient. It is for this reason that these authors quantify knowledge sharing through both frequency and value. Beyond these two dimensions of sharing behaviors, intention to share is a third indicant some scholars deem necessary to better capture knowledge sharing (Bock, Zmud, Kim, & Lee 2005, Usoro et al., 2007, Wang & Noe 2010). There is evidence to support that each of these three measurable dimensions (frequency, value, and intention) must be included in the measure of knowledge sharing to have a more complete measure of the construct (Usoro et al., 2007).

Unique knowledge. Teams, larger groups, and organizations do not maximize the utility of the individual's knowledge if individual team members fail to share and integrate the unique information, or expertise that each member possesses (Nonaka & Takeuchi, 1995). While overlapping knowledge sharing is unavoidable and necessary in the initial distribution of experiential resources, the essence of knowledge sharing's meaningfulness is to enrich the individual's repository of new or unique information. Gigone and Hastie (1993) described a "common knowledge effect," wherein cognitive biases underemphasize the contribution of unique information and overemphasize overlapping knowledge that members had prior to meeting. These effects are more pronounced in groups with highly similar knowledge and less so in heterogeneous experientially dispersed teams. Jehn, Northcraft, and Neale (1999), described heterogeneous experientially dispersed team members as knowledge differences in three areas:

education, experience, and expertise. Knowledge, especially unique knowledge, can be construed by individuals as means to elevate power and status in groups and organizations (Davenport, 1997). Such concerns over power, rationale gain, and distrust give grounds to individuals refraining from knowledge sharing behaviors. Psychological underpinnings in the communicative process that lead to refrainment of knowledge sharing of uniquely held information can be partially explained by felt ownership over unique information (Webster et al., 2008). Psychological ownership will be discussed in a following section as a potential source of such underpinnings.

Psychological Ownership Background: Emergence and Construct Elaboration

While psychological ownership (PO) is generally experienced as involving person to object relations, it can also be felt toward nonphysical entities (Pierce, Kostova, & Dirks 2003). The underpinnings of psychological ownership can be traced back to the idea of "psychology of mine and property" from a number of studies conducted during the mid to late 20th century (Furby, 1991). While a comprehensive account of the genesis of this cognitive-affective state is beyond the scope of this paper, a brief review of scholarly explanations for the emergence of psychological ownership reveals that genetic, societal, and sociobiological postulations are in the literature (Darling, 1937; Furby, 1976; Wilson, 1975, respectively). Presently, psychological ownership can conceptually be defined as the state in which an individual identifies a target for ownership as "mine" (Pierce et al., 2003). As such, knowledge can be construed as a target of psychological ownership. Unpacking this construct further reveals distinct psychological features, which function to manifest the target of ownership through cognitive and affective connections with the self. These features are described by Furby (1978) as drivers for the target of ownership becoming part of the "extended self" and are accompanied by cognizance of

efficacy and competence (White, 1959). Broadly speaking, Dittmar (1992) identified and subsequently, Pierce et al. (2003) endorsed three sociobiological motives for human psychological ownership: efficacy and effectance, self-identity, and "having a place." The latter motive is not applicable to nonphysical entities such as knowledge. While certain nonphysical entities may be tied to having a place as a motive for ownership, a vast body of knowledge is amassed over several years in different locations, thus having a place seems to have little relevance. Readers' interests in further exploration of this motive should be referred to the two aforementioned articles. However, the first two motives will be discussed below.

Defining motives of PO. When speaking of efficacy and effectance motives for psychological ownership, the literature points to an individual's drive for effectance and the ability to produce desired outcomes. According to Pierce et al. (2003), the motivation of effectance is in essence being the cause of change in one's environment. Those same authors state the causality of "being the cause" of change as giving way to feelings of efficacy and intrinsic pleasure for having altered something through one's control. Therefore, the control that individuals feel in their physical surrounding stems from the control of the target of ownership, control over the target of ownership, and the use of the object as an instrument for exerting control over other parts of one's physical surrounding (Pierce et al., 2003).

In addition to instrumental and utility functions of psychological ownership is the motive of self-identity. The self-identity motive of psychological ownership can be identified as the sum of three distinct parts. First, one's target of ownership can play a role in self-understanding when one views the target as an extension of him or herself. Second, ownership of a target plays a role in interactions with others. Thus, an individual's ownership can be viewed as a communicative tool with others to express the self and to signify power (Dittmar, 1992). Finally, the self-identity

motive can be seen as fulfilling the ever-changing maintenance of self-continuity. Cram and Paton (1993) stated that possessions are "repositories of memories of one's self identity in the past" (p. 19). Here, the authors proposed that people use targets of ownership as artifacts of the self that serves to give self-continuity over time.

Knowledge and Ownership

Dynamics between constructs. The acknowledgement of team members' expertise has been identified time and again as a driving force in increasing the overall effectiveness and participation in knowledge sharing behaviors within a team (Wang & Noe, 2010). Additionally, as previously stated, teams do not make full use of members' knowledge if members fail to share and integrate the unique knowledge that each member possesses (Nonaka & Takeuchi, 1995). Past literature has also found that team members are not likely to share unique information or information that compromises their own position (Wittenbaum, Hollingshead, & Botero, 2004).

It is an inferential assumption of this paper, based on the extant literature on psychological ownership, that due to the motive of efficacy and effectance, both expert and non-expert team members will feel a degree of psychological ownership to unique information and, to perhaps a lesser extent, general pertinent knowledge in the area of the team's domain. Furthermore, it is an assumption of this paper that experts will feel the additional motive of self-identity toward unique information and the repositories of knowledge (common or unique) in their area of expertise in general. This assumption can be supported by Furby (1978), who argued that the greater the amount of control a person can exercise over certain objects, such as an expert's control over knowledge in his/her field, the more s/he will psychologically construe the object as an extension of the self.

Here, the literature on the self-identity motive of ownership as it pertains to knowledge

sharing comes to a dichotomous standstill of conclusions. It follows logically that knowledge sharing of psychological targets of ownership can lead to a diminishing of the self, but to the point of this paper, psychological ownership of nonphysical entities may be either easier to share (i.e., less of a psychological burden to give up) or are invulnerable to losing meaning to the self when assimilated into others through sharing (i.e., an individual's psychological ownership persists beyond sharing). However, studies of ownership semantics yield ownership to mean the ability to use and to control the use of objects (Rudmin & Berry, 1987). Thus, an object's instrumentality brings efficacy and effectance back into frame. This second conclusion should explain why owners might have a willingness to share knowledge. In other words, it is possible that using knowledge exercises ones' efficacy and empowers self-identity in the process. To theoretically inform on the role of the self-identity component of PO and any appreciable and definitive implications on knowledge sharing, one must visit the opposing camps of how PO is conceptualized.

Conceptualizations of psychological ownership. The two competing conceptualizations of PO can be distinguished both in terms of approaches taken to measure the construct and by the disagreement regarding territoriality. One group of scholars (e.g. Brown, Lawrence, & Robinson, 2005; Brown, Pierce, & Crossley, 2014b; Pierce, Kostova, & Dirks, 2001; 2003) views territoriality as an outcome of PO. This camp of scholars endorses what we refer to in this paper as a "traditional view of PO," wherein the three previously described sociobiological motives of PO are the sole components. Beyond this distinction, the traditional conceptualization of PO can be set apart by a belief in only one true form of PO and is directly measured through questionnaire items. In contrast, another camp of scholars (e.g., Avey et al., 2009; Avey, Wresting, & Panelski, 2012) views territoriality as one of the components of PO and that

territoriality is viewed as one component of two discrete forms of PO, that is, promotive and preventative forms of PO. The second conceptualization of PO can be distinguished by one preventative self-regulatory component (territoriality) and the other four components (accountability, self-efficacy, belongingness, and self-identity) are a promotive form of PO. In this conceptualization, PO is indirectly measured through questionnaire items based on the components of it. Both accountability and territoriality are foci of promotive and preventative self-regulatory goals measured beyond the three motives that form the basis of the traditional conceptualization of PO in from likes of Van Dyne and Pierce (2004). Accountability itself is beyond the scope of this study and elaboration of a more in-depth discussion of PO measurement can be found in Dawkins et al. (2017). I presently will defend the inclusion of territoriality as a component of PO as proposed by Avey et al. (2009), and discuss below how this conceptualization has implications for knowledge sharing in the following sections.

Self-identity as inseparable from the emergence of territoriality. Targets of PO have been described as extensions of the self (Pierce et al., 2001; 2003). To this point, the function of the self-identity motive is to inform on the individual's self-continuity through construing targets of ownership as extensions of the self. The self-identity motive is integral to claiming territoriality as a component of PO. Brown et al. (2005) conceptualize territoriality as a mindset of *mine and not yours*. Inherent in a conceptualization of the self is the notion of exclusivity or boundaries that separate that which is construed as *mine* from that which is apart from the self. In other words, conceptualized boundaries that separate the self from that which is apart from the self is basis of *mine and not yours*. Theoretically speaking, the emergence of the self and that which is apart from the self (mine and not yours) are inseparable as they complement one another to establish continuity of self-identity over a period of time.

For example, imagine a scenario where a manager successfully completed a seminal project in their organization and needs to decide whether to share or withhold information which the manager "owns" with a team in a different division of the company. In this scenario, the manager decides to withhold the information to seek to avoid change and maintain stability. Here, self-identity is a motive leading to feelings of PO toward the information gained from the seminal project completed in the manager's organization. The concept that the information is "mine and not yours" is less of an outcome and more of an inherent assumption in the manager's decision to share or withhold the information. Without this assumption, there is no meaningful decision for the manager to make regarding sharing or withholding information. Territoriality is a motive with emergence in feelings of that which is "mine" through the lens of preventative self-regulatory goals described by Higgins (1997; 1998) where one is motivated to ensure stability, safety, and predictability.

In development of the self-identity motive and through targets of ownership one can find the basis of territoriality involved early in the development of feelings of ownership, through the boundaries of what is part of the self and what is not. The emergence of self-identity and territoriality are in synchrony and cannot be separated into a component that helps form the basis of PO and an outcome of it. If territoriality as a construct cannot be separated from the early developmental stages where feeling of ownership emerge, the two should be treated as interrelated promotive and preventative motives that help form the basis of PO development. As support for the interrelatedness of the two, one can again refer to Brown et al. (2005). While these authors do not endorse territoriality as a component of PO, they do nevertheless argue that ownership and self-identity are so interrelated that people engage in territorial behaviors as a way to defend possessions as an extension of themselves. One would go further to state self-identity

and territoriality are interrelated to the extent that the two develop in synchrony due to the notion of exclusivity in self-identity. However, this is not to say that there are no observable territorial outcomes of PO; rather, territoriality is a component and can also have observable outcomes. Moreover, the term *territorial ownership*, as will be used below, will refer to the preventative component of the PO territoriality sub-scale in the measure by Avey et al. (2009) exclusively and is not part of a taxonomic effort to categorize types of PO. The greater implications one can conclude from the self-identity motive on knowledge sharing can be explained through territorial ownership, which is further elaborated below.

Territoriality. The four promotive components and one preventative component of the expanded conceptualization of PO proposed by Avey et al. (2009) were inspired by regulatory focus theory from by Higgins, (1997; 1998). Self-regulation refers to how individuals select goals. Those who use promotion-focused self-regulation pursue goals that reflect their aspirations while preventative-focused self-regulation individuals focus on avoiding negative outcomes (Kluger, Stephan, Ganzachm & Hershkovitz, 2004). Promotive and positive outcomes of psychological ownership have been examined and conveyed by numerous studies such as Pierce et al. (2001; 2003). Territoriality can be distinguished from "having a place" or "belongingness" in that territoriality can be construed as involving territorial feelings over a target as well as territorial behavioral outcomes toward maintaining claim over the target. Territoriality can offer insight into why individuals with psychological ownership would be reluctant or refuse to share knowledge. Territoriality involves feelings of ownership (e.g., this is mine), but can be distinguished by its preventative self-regulatory emphasis (e.g., this is mine and not yours) (Brown et al., 2005). Of the different types of territorial behaviors postulated in

past literature (Brown et al., 2005), both control-oriented and identity-oriented can be identified as pertinent to motives for psychological ownership and knowledge sharing.

Control-oriented territoriality serves to convey a claimed territory over a target and discourage others from using it (Webster et al., 2008). As a result, control-oriented territoriality discourages others from engaging in knowledge sharing (Webster et al., 2008). This orientation of territoriality harkens back to the psychological ownership motive of effectance and efficacy. Effectance, or being the cause of change, gives way to feelings of efficacy and intrinsic pleasure for having altered something through one's control. Consequently, the symbiotic relationship between efficacy and territoriality can be illustrated through the effectance from control-oriented territoriality. This suggests a more flexible or symbiotic categorization of promotive and preventative components of psychological ownership as identified by Avey et al. (2009). For example, one can make the assumption that control-oriented territoriality is a driver for behaviors leading to effectance and subsequent feelings of efficacy. In this case, a preventative component is elucidative toward a promotive component.

Identity-oriented territoriality involves individuals personalizing targets to serve the function of enabling them to construct and express their identity to the self and others (Webster et al., 2008). This type of territoriality echoes the psychological ownership motive of self-identity. This motive postulates that targets of ownership act as artifacts of the self that serve to give and maintain self-continuity over time. While the self-identity motive offers no conclusive implications for knowledge sharing, it may inform on sharing through the lens of territoriality. As previously stated, knowledge sharing of psychological targets of ownership can either lead to a diminishing of the self or lead individuals to express their identity. Identity-oriented territorial behaviors can lead individuals to be either reluctant to share knowledge or be more active in

promoting that what they want to project about the self (Webster et al., 2008).

The relationship between psychological ownership and knowledge sharing or the extent to which individuals are likely to share what they feel to be "mine" is likely informed by the presence of attitudinal variables. When the target of ownership is the organization, attitudinal variables such as job satisfaction and organizational commitment have been positively related to psychological ownership (Avey et al., 2009), suggesting that collective psychological ownership has positive relationships with these variables because there is a group-level collectively held sense that a specific target of ownership is construed as collectively "ours" (Pierce & Jussila, 2010). Although collective psychological ownership is beyond the scope of this paper, it should be noted that this positive relationship between collective psychological ownership and attitudinal variables was the impetus for choosing moderating variables in the present study.

Employee Attitudes as Moderators

Within the extant literature on psychological ownership, workplace outcomes of PO make up the lion's share of focus. When the target of ownership is the organization, studies have found PO to influence positive attitudinal outcomes such as organizational citizenship behaviors (Pierce et al., 2003), job satisfaction (Avey**,** Wernsing, and Palansk, 2012), organization-based self- esteem (Liu, Wang, Hui, & Lee, 2012), and work engagement (Ramos Man, Mustafa, & Ng, 2014) identified by Dawkins et al. (2017). A much more limited number of studies have focused on moderators of the relationship between PO and workplace outcomes. Dawkins et al. (2017) found only five studies that focus on moderating conditions of the PO-workplace outcomes relationship. From the limited body of literature focusing on moderators of the relationship between PO and various workplace outcomes, and from inferential assumptions based on the existing PO literature, below are three attitudinal variables that may moderate the

relationship between PO and knowledge sharing. A review of these constructs is provided below.

Organizational commitment. Organizational commitment can be defined as an affective and attitudinal factor. It can be characterized as an employee's adoption of an organization's goals and values, willingness to apply considerable effort for the organization, and the desire to maintain membership to the organization (Mathieu & Zajac, 1990). Other types of organizational commitment exist, such as calculated commitment, which is a calculative bond between the individual and organization wherein commitment is "bought" by side bets or sunk costs invested in the organization. It is postulated in the review on OC by Mathieu and Zajac (1990) that these two types of OC may in fact become more closely linked over time spent with an organization. Overlap in these definitions is further pointed out by these authors in their assessment that measurements of these two types contain elements of each other. Previous studies looking at psychological ownership as well as knowledge sharing also chose to look at organizational commitment through the affective lens (Han, Chiang, & Chang, 2010; Lin, 2007). Affective organizational commitment was investigated in this study based on past work and this study's focus on attitudinal moderators.

Trust. To understand the construct of trust as it is defined in this paper, the construct of trustworthiness warrants definition. Trustworthiness is "the subjectively perceived point on a continuum at which an individual's behaviors are perceived as complying with the ethical duties considered to be owed to the person who is making the decision to trust," (Caldwell & Jeffries, 2001). Trust itself is an expression of faith in a person or larger entity's fairness, reliability, ethical acuteness, competence, and benevolence (Caldwell & Clapham, 2003). Pearce, Branyiczki, and Bigley (2000) argued that environment of trust forms and evolves on the basis of personal trust as well as other contextual factors. As such, trust can be parsed into two distinct

moderating variables - personal trust (i.e., trust in one's coworkers) and an environment of trust.

Job satisfaction. Job satisfaction can be defined as "an employee's overall evaluation of his or her job as favorable or unfavorable" (Locke, 1976). Facets of workplace job satisfaction are pay, promotion opportunities, supervision, and co-workers (Jex & Britt, 2014; pg. 250). Job satisfaction can be seen through the lens of attitudes toward a job, cognitive beliefs about a job, or behavioral tendencies toward their job (Jex & Britt, 2014; pg. 247). Regardless of the lens, employees make assessments of the above-mentioned facets. Satisfaction occurs when employees judge what they are receiving from the organization as at or above expectations of a facet. (Jex & Britt, 2014; pg. 250). Satisfaction also is affected by the weight employees give to different facets, i.e., the importance they place on opportunities versus pay (Locke, 1976). Concerning outcomes of job satisfaction, the highest correlates are attitudinal in nature. Examples of attitudinal outcomes include organizational commitment, job involvement, frustration, job tension, and feelings of anxiety. (Jex & Britt, 2014; pg. 261)

The Current Study

The purpose of the current study was to understand psychological underpinnings of knowledge sharing, by examining why individuals are less than likely to share unique information for the collective knowledge of the team, group, or organization. A basic initial goal of this study was to examine, in an exploratory manner, the relationship of knowledge-based PO to knowledge sharing as conceptualized by Brown, Pierce, and Crossley (2014b). These authors conceptualized PO emergence through the individual's work environment. Specifically, this conceptualization focused on job complexity to understand how feelings of ownership develop. These authors endorsed the three original components of PO identified by Dittmar (1992) and

Pierce et al. (2001): efficacy and effectance, self-identity, and belongingness. Under this conceptualization, these components are all understood to be entailed in PO genesis alone.

The conceptualization of PO as the preventative component outlined by Avey et al. (2009) served as the basis for hypotheses. Due to this study's emphasis on psychological hindrances of knowledge sharing, territorial ownership, i.e., the territorial component of PO, was focused upon. Research on territoriality from Brown et al. (2005), proposed felt ownership over knowledge leads individuals to resist knowledge sharing. Felt ownership also tends to manifest when considerable investments go into them (Pierce et al., 2001). As such, the more knowledge one amasses and the more s/he toils to gain expertise, the more likely ownership and hoarding behaviors are likely to emerge. Other research suggests individuals tend to feel ownership over a target that they gain knowledge about (Beggan & Brown, 1994). According to Webster and colleagues (2008), the more involved individuals are in creating the knowledge, the more likely they have a stronger claim to it. These attachments to knowledge are informed by territoriality or the idea that something is "mine and not yours."

As an outcome of knowledge-based PO, knowledge sharing itself can be construed as the intention to share or actual behavior of sharing. Both intention to share knowledge and knowledge sharing behaviors are grouped together by Wang and Noe (2010) as knowledge sharing outcomes of environmental, motivational, and individual factors. Past research has found knowledge sharing intentions to be predictive of sharing behaviors (Bock & Kim, 2002; Cabrera, Collins, & Salgado 2006; Lin 2007a; 2007b). In the current study, both intention to share and reported past behavior were dependent variables. While researchers have identified intention to share as being more susceptible to social desirability biases (Wang & Noe, 2010), cognitive biases that affect an individual's ability to accurately evaluate past behaviors in self-reports

skews the accuracy of an individual's evaluations. For example, characteristics of the common knowledge effect that lead individuals to underemphasize the contribution of unique knowledge and overemphasize overlapping knowledge would skew an individual's evaluation of past behavior (Gigone & Hastie, 1993). It is expected that the relationship between PO toward the target of knowledge and knowledge sharing intention and behavior is negative, such that territorial behaviors of ownership over knowledge are negatively related to levels of knowledge sharing.

Hypothesis 1a: Participants who report higher territorial ownership over knowledge will have lower intentions to share knowledge.

Hypothesis 1b: Participants who report higher territorial ownership over knowledge will be less likely to have shared knowledge.

While it is predicted that felt territorial ownership over knowledge has a negative relationship with knowledge sharing, employee attitudes are expected to moderate this relationship's strength and directionality. It should be noted that when speaking of strength and directionality, the proposed attitudinal moderators are not expected to cease felt PO per se. Rather, the moderators are expected to lower the territorial component of PO such that the negative relationship between territorial ownership and knowledge sharing is less negative. The distinction between lowering PO and lowering the territorial component of PO is the distinction between *mine* to *anyone's* and *mine* to *ours*. In an *ours* reference to the target of PO, felt territory is expanded to a colleague, team, or organization. The implication of this theoretical nuance is that the proposed moderators open the exclusivity inherent in territorial ownership to others while not necessarily lowering any components of PO themselves.

The first attitude of interest to this paper is organizational commitment. As defined

above, organizational commitment refers to the adoption of an organization's goals and values, willingness to apply considerable effort for the organization, and the desire to maintain membership to the organization (Mathieu & Zajac, 1990). Felt membership to an organization should evoke a collective orientation of *us* and *our* in the self. In attempting to maintaining membership to the organization, an individual would likely project that collective orientation toward resources within the organization such as knowledge. As support for this claim, Pierce and Jussila (2010) found that those high in organizational commitment should be more inclined to see their resources as *ours* instead of *mine*. Along this line, Constant, Kiesler, and Sproull (1994) found belief in an *ours* style of organizational ownership encourages attitudes of sharing. Han et al. (2010) found PO leading to higher knowledge sharing behavior through enhancing employees' organizational commitment. Similarly, Peng and Pierce (2015) found organizational commitment decreased knowledge holding behaviors and facilitated sharing. One can further make the case for organizational commitment acting a as a potential moderator in the relationship between PO and knowledge sharing. Past research has shown a positive relationship between employee decision-making and organization-based PO. Furthermore, this relationship was successively associated with higher organizational commitment (Han et al., 2010). Organizational commitment has been further linked to PO by scholars who have showed that organizational commitment is positively related to organization-based PO (Chi & Han, 2008). Further studies indicating PO and organizational commitment connections can be drawn from research in which both were outcomes of decision-making style and a self-managing team climate (Liu et al. 2012). A compelling assertion regarding the relationship between PO and organizational commitment comes from Pierce and Jussila (2010), who state that collective PO can have positive effects on individual-level outcomes such as affective commitment. This

assertion not only supports organizational commitment as a potential moderating variable, but also supports the moderator characteristics posed above about strength and directionality. Positive effects on individual-level outcomes as a result of collective states of mind or lowering *mine* while increasing *ours* supports the assertion that PO does not subside from individual-level attitudinal variables. Instead, it merely lowers territorial ownership. Therefore, it is expected that organizational commitment will moderate the relationship between territorial ownership of knowledge and knowledge sharing.

Hypothesis 2a: Affective organizational commitment will moderate the relationship between territorial ownership over knowledge and knowledge sharing intent such that the relationship will be less negative when affective organizational commitment is high than when it is low.

Hypothesis 2b: Affective organizational commitment will moderate the relationship between territorial ownership over knowledge and knowledge sharing behavior such that the relationship will be less negative when affective organizational commitment is high than when it is low.

The second attitude of interest to this paper is personal trust. As noted above, trust is an expression of faith in a person or larger entity's fairness, reliability, ethical acuteness, competence, and benevolence (Caldwell & Clapham, 2003). The moderating effect of trust on the territorial PO and knowledge sharing relationship can be classified into two parts- personal trust in colleagues and environment of trust from the organization. The rationale for dividing these two constructs is that personal trust with a colleague could exist distinctively from a perceived environment of trust and vice versa. A lack of trust, or more specifically, a lack in the element of fairness may underlie ineffective social exchanges (Blau, 1964) that could lead to

withholding of knowledge from colleagues. Usoro et al. (2007) found trust to be a major determinant of knowledge sharing. Their findings suggested perceived trust in the competence, benevolence, and integrity of online communities as predictive of knowledge sharing. Other scholars specifically discriminate between personal trust and environment of trust as predictive of knowledge sharing (Andrews & Delahaye, 2000; Corritore, Kratcher, & Weidenbeck, 2003, respectively). Scholars investigating trust as it relates to knowledge sharing provide further rationale as to why it should be investigated as a moderating variable between the PO and knowledge sharing relationship. Organizations that emphasize a culture of trust have found negative effects of perceived costs of sharing to be lessened among employees (Kankanhalli, Tan, & Wei, 2005). Although the foci of perceived costs of sharing in the previously mentioned study did not explicitly associate with PO as a perceived cost of sharing, these results can reasonably warrant further investigation into an expanded focus of trust's effects on perceived costs of sharing- with PO in mind. This research provides a clear rationale for trust as a moderator for both PO and knowledge sharing. Other research has focused on increasing cooperative team perceptions in organizations where a culture of competitiveness exists. In increasing cooperative team perceptions, trust and likewise knowledge sharing behaviors increase (Schepers & Van den Berg, 2007; Wang, 2004; Willem & Scarbrough, 2006). On a more micro level, trust can be tied to PO and knowledge sharing through Kankanhalli et al. (2005). An antecedent to PO emergence as outlined by Pierce et al. (2001), was amount of effort exerted toward the target of ownership. Accordingly, Kankanhalli et al. (2005) found the more time and effort employees perceived necessary to arrange knowledge for sharing, the less likely they were to commit to knowledge sharing behaviors. These researchers noted this reluctance to share as especially noticeable when there were low levels of personal trust between employees.

Through the means of reciprocity (discussed in more depth below), perceived fairness and trust could positively affect knowledge sharing (Webster et al., 2008). Furthermore, individual differences in trust have been identified as potential cause in variability in knowledge sharing (Connelly, Zweig, & Webster, 2012). Brown et al. (2014a) investigated the variable of perceived trust in the individual's environment and found it to moderate the relationship between felt PO over an object and sharing. Individuals exhibited territorial behaviors over targets of felt ownership; however, the moderating variable of trust lessened said territorial behavior. While the former study focused only on environmental trust, it has been argued that environment of trust forms and evolves on the basis of personal trust (Pearce, Branyiczki, & Bigley, 2000). It therefore follows logically that should environment of trust have its genesis in personal trust, both should characteristically affect territoriality and sharing comparably to one another.

Hypothesis 3a: Personal trust will moderate the relationship between territorial ownership over knowledge and knowledge sharing intent such that the relationship will be less negative when personal trust is high than when it is low.

Hypothesis 3b: Personal trust will moderate the relationship between territorial ownership over knowledge and knowledge sharing behavior such that the relationship will be less negative when personal trust is high than when it is low.

Hypothesis 4a: Environment of trust will moderate the relationship between territorial ownership over knowledge and knowledge sharing intent such that the relationship will be less negative when environment of trust is high than when it is low.

Hypothesis 4b: Environment of trust will moderate the relationship between territorial ownership over knowledge and knowledge sharing behavior such that the relationship will be less negative when environment of trust is high than when it is low.

The final employee attitude of interest to this paper is job satisfaction defined as is the sense of satisfaction in an individual's evaluation of his or her job as favorable or unfavorable (Locke, 1976). Research into the relationship between job satisfaction and PO that would warrant reason to include the former variable as a worthwhile moderator in the relationship between PO and knowledge sharing comes from scholars who have demonstrated PO to be an influence on job satisfaction (Avey et al., 2012; Bernhard & O'Driscoll, 2011; Knapp, Smith, & Sprinkle, 2014; Mayhew, Ashkanasy, Bramble & Gardner, 2007, Peng & Pierce, 2015; Sieger, Bernhard & Frey, 2011). Further research that focused on enhancing employee extrinsic job satisfaction through participation in a stock ownership initiative yielded a positive effect on organization-based PO (Chiu et al. 2007). Beyond concrete scholarly research on the relationship between PO and job satisfaction, social exchange theory can offer additional theoretical rationale for the inclusion of the variable as a moderator. Social exchange theory can help explain the moderating effect of job satisfaction on the territorial PO and knowledge sharing relationship. According to the norm of reciprocity, should individuals feel contributed to, they will feel a willingness to contribute in turn. It follows here that should individuals feel job satisfaction, they will be more willing to reciprocate (Cropanzano & Mitchell, 2005). These same authors offered a tripartite definition of reciprocity within social exchange theory. They defined reciprocity as a transactional pattern of interdependent exchanges, a folk belief, and a norm and individual orientation. To the first definition, knowledge sharing could be motivated by quid pro quo attitudes imparted by job satisfaction. To the second definition, folk belief "involves the cultural expectation that people get what they deserve" (Cropanzano & Mitchell 2005). Although reciprocity is assumed to be universal, the third definition of reciprocity states that individuals and cultures vary in their adherence to reciprocity principles (Cropanzano & Mitchell, 2005). In

a similar vein, research investigating the relationship between job satisfaction and knowledge sharing can provide rationale for using the attitude as a moderator in the present study. A study of job satisfaction suggests this attitude to be linked to the sharing of knowledge (De Vries, Van den Hooff, & de Ridder, 2006). A presupposition to job satisfaction as a moderator is that a general sense of satisfaction is in no small part attributable to micro-level interactions between colleagues. In summation, interactions with colleagues that contribute to job satisfaction may stimulate reciprocal behaviors such as knowledge sharing. Accordingly, researchers have demonstrated that different dimensions of job satisfaction, such as individual-level interactions, can influence one's motivation to share knowledge (Pascoe, Ali, & Warne, 2002). Therefore, it is expected that job satisfaction will moderate the relationship between territorial ownership of knowledge and knowledge sharing.

Hypothesis 5a: Job satisfaction will moderate the relationship between territorial ownership over knowledge and knowledge sharing intent such that the relationship will be less negative when job satisfaction is high than when it is low.

Hypothesis 5b: Job satisfaction will moderate the relationship between territorial ownership over knowledge and knowledge sharing behavior such that the relationship will be less negative when job satisfaction is high than when it is low.

Method

Participants

We chose to study university professors for several reasons. First, as noted by Pierce et al. (2001), for felt ownership over knowledge to manifest, considerable investment must go into acquiring it. Second, university professors can be characterized as high knowledge workers (Reinhardt, Schmidt, Sloep, & Drachsler, 2011). Third, these employees have the opportunity to

manifest a felt intellectual property over their course materials and research, such that a sense of ownership of knowledge can be acquired. Finally, there are opportunities for professors to share knowledge with colleagues.

Participants were full and associate professors within a large Midwest university system. A total pool of 1,442 participants was recruited, and 213 participants participated, with a response rate of 14.77%. Thirty-two respondents were excluded from data analyses after those participants who failed to respond to an adequate amount of questionnaire items were removed. Missing data was treated with common-point imputation where participants were missing one item response within one measure. In instances where multiple item responses were missing within one specific measure, participant responses for that specific measure were excluded from analyses unless otherwise instructed by missing data procedures written by authors of a measure. Final participants were 181 professors. The following information reports percentages for those who responded to demographics items. There was a fairly even split between associate professors (48.1%) and full professors (42.0%). Participants were predominantly white (79%), followed by Asian (4.4%), Other (4.4%), Hispanic or Latino (0.6%), and Native American (0.6%). Male participants (46.4%) slightly outnumbered female participants (37.8%). The majority of participants fell between the ages of 45-54 and 55-64 (28.7% and 25.4% respectively), while the age ranges of 65-74, 35-44 and 75 or older rounded out the rest of participants (22.1%, 10.5%, and 1.1% respectively). The vast majority of highest education level was a doctorate degree (80.1%) followed by professional degree (5.5) and master's degree (3.9%). If one uses education level as a proxy for knowledge, this demographic split increases the confidence that participants were high knowledge workers. Experience as an instructor ranged between seven and 10 or more years, with the vast majority reporting 10 or more years

(84.0%). Participant responses for years at current university were similar to overall experience as an instructor; approximately three-fourths of participants reported 10 or more years at current university (73.5%). Finally, participants reported the majority of their time approximated to teaching (44.7%) followed by research (35.4%) and service (19.9%).

Procedure

University email addresses of potential participants were obtained through a database provided by the university's institutional research offices. Potential participants were sent a mass email asking for their participation in a research study on knowledge sharing habits of university professors, with a follow-up email sent two weeks later. Measures in the questionnaire were ordered in terms of the two DVs, the two conceptualizations of PO, the attitudinal variables, social desirability, and demographics. Questionnaire debriefing explained that the purpose of the study was to understand psychological impediments to sharing knowledge such as felt ownership over knowledge and emerging feelings of territoriality.

Participants were given specific instructions for each measure (see appendices). Knowledge and knowledge sharing were defined for the participants as *the individual's know-how or something which is helpful in teaching ones' courses* and *providing or transferring one's knowledge to others*, respectively. Knowledge sharing was further clarified as possible through various methods such as formal and/or informal meetings and information systems. Targets of knowledge were adapted from original items when necessary for relevance to the sample population. For example, targets of knowledge in the measure from Bock et al., (2005) such as *work reports* and *official documents* were changed to *course materials* and *syllabi*. Participants completed questionnaires via a link to *Qualtrics,* and were compensated with a $5 gift card.

Measures

Psychological ownership questionnaire. The territorial component of PO was assessed using a scale developed by Avey et al., (2009). Reliability for the scales was high (α = .81). Responses were measured using a 7-point (*strongly disagree* to *strongly agree*) Likert-type scale. Sample items include "I feel I need to protect my ideas from being used by others in my organization" and "I feel that people I work with in my organization should not invade my workspace."

Psychological ownership. A traditional measure of PO as conceptualized by Brown, Pierce, and Crossley (2014b) was administered to explore the relationship between knowledge-based PO and knowledge sharing. Reliability for the scales was high (α = .93). Responses were measured using a 7-point (*strongly disagree* to *strongly agree*) Likert-type scale. A sample item is "I sense that this knowledge is MINE."

Knowledge sharing intention. Knowledge sharing was assessed using an adapted knowledge sharing behavior scale developed by Bock et al. (2005). Responses were measured using a 5-point (*strongly agree to strongly disagree*) Likert-type scale. This intention to share knowledge scale is broken into intention to share explicit knowledge and intention to share implicit knowledge sub-scales. Reliability for the scale was acceptable (α = .80). Example items from each subscale are "I have frequently shared my course materials and syllabi with members of my colleagues in the past" and "I have always provided my know-how at the request of other colleagues." The Marlowe-Crowne Social Desirability Scale 13-Item Short Form (Crowne & Marlowe, 1960) was administered. Reliability was .67. A sample item is "It is sometimes hard for me to go on with my work if I am not encouraged."

Knowledge sharing behavior. Knowledge sharing behavior was measured using an adapted scale developed by Usoro et al., (2007). This measure quantifies knowledge sharing as

both the frequency and value of the knowledge being shared; it combines items of quality (questions 3-6), quantity (questions 1-2), as well as an item assessing the overall frequency and value of sharing (question 7). Reliability of the measures was acceptable (α = . 86). Responses will be measured using a 7-point (*strongly agree to strongly disagree*) Likert-type scale. Samples of quality and quantity items are "The knowledge I share with the community has a positive impact on it" and "I am one of the more active contributors within the community" and "I frequently share my knowledge with colleagues in the institution" respectively.

Organizational commitment. Organizational commitment was measured using an affective commitment scale developed by Allen and Meyer (1990). Responses were measured using a 7-point (*strongly agree to strongly disagree*) Likert-type scale. Reliability of the measures was high (α = .90). A sample item of the scale is "I would be very happy to spend the rest of my career with this organization."

Personal trust. Personal trust was measured using a scale with the prompt, "please indicate your level of agreement with the following statements" (McAllister**,** 1995). Responses were measured using a 7-point (*strongly agree to strongly disagree*) Likert-type scale. Reliability of the measures was high (α = .92). A sample item of the scale is "My co-workers are truthful in their dealings with me."

Environment of Trust. Environment of trust was measured using a 5-point Likert five-item measure from Brown, Crossley, and Robinson, (2014a). This measure was adapted from a personal trust measure from Pearce, Branyiczki, and Bigley, 2000. Reliability of the measures was high (α = .89). A sample item would be "I can rely on those I work with in this group."

Job satisfaction. Job satisfaction was administered by the 18-item Job in General (JIG) to measure global satisfaction (Balzer et al., 1997). Reliability of the measures was good (α = .89). A sample response would be "yes, no, or cannot decide if your job in general is pleasant".

Analytical Strategy

Prior to conducting a hierarchical multiple regression, several assumptions were tested. Firstly, a sample size between 161 and 181 was deemed adequate given five independent variables to be included in the analysis (Tabachnick & Fidell, 2001). The assumption of singularity was also met as the independent variables (affective organizational commitment, personal trust, environment of trust, job satisfaction, and territorial ownership) were not a combination of other independent variables. An examination of correlations (see Table 1) revealed that no independent variables were highly correlated, with the exception of personal trust and environment of trust. Variance inflation factor (VIF) collinearity diagnostics revealed no variables exceeded a threshold of 5 and only personal trust and environment of trust exceeded 3, suggesting little concern for the potential for multicollinearity. At this point, the assumption of multicollinearity was deemed to have been met (Hair, Black, Babin, Anderson, & Tatham, 1998). Residual and scatter plots indicated the assumptions of normality, linearity, and homoscedasticity were all satisfied (Hair et al., 1998).

To test for moderation within the hierarchical regression model, Baron and Kenny's method (1986) was adopted. The predictor and criterion variables were mean-centered to lessen potential concerns over multicollinearity and moderating interaction terms were computed by multiplying the attitudinal variables by the IV (territorial PO) to then be used in regression analysis with the DVs (knowledge sharing intent and behavior). The attitudinal variables were entered in the first block because prior research suggests they are related to knowledge sharing

intent and behavior (Wang and Noe, 2010). Territorial PO was entered in the second block to effects of PO on the dependent variables after controlling for attitudes. Finally, moderating interaction terms for the attitudinal variables were added in block three.

Results

Table 1 presents the descriptive statistics and Pearson correlations for study variables. Hypotheses were tested using hierarchical multiple regression for knowledge sharing intent and knowledge sharing behavior. First, a three-block hierarchical multiple regression was conducted with knowledge sharing intent as the dependent variable. Block one consisted of attitudinal variables followed by territorial PO in block two. The moderation interaction terms were introduced in block three. The model of best fit consisted of affective organizational commitment and territorial PO as predictors of knowledge sharing intent. The model was statistically significant, $F(2, 164) = 15.27$, $p < .001$, and accounted for approximately 16% of the variance in knowledge sharing intent ($R^2 = .157$). The regression statistics are displayed in Table 2. Territorial PO significantly predicted knowledge sharing intent; therefore H1a was supported. Participants who reported higher territorial ownership over knowledge reported lower intentions to share knowledge. Beta coefficients for the attitudinal variable moderators were: organizational commitment, $\beta = .025$, $t = .343$, $p = .732$, n.s; personal trust, $\beta = -.035$, $t = -.470$, $p = .639$, n.s; environment of trust, $\beta = -.011$, $t = -.153$, $p = .879$, n.s; and job satisfaction, $\beta = .032$, $t = .435$, $p = .664$, n.s. Based on the regression model, neither affective organizational commitment (H2a), personal trust (H3a), environment of trust (H4a), nor job satisfaction (H5a) significantly moderated the criterion variable.

Table 1
Reliabilities, N, M, SD, and Correlations Among the Study Variables

Variables	*M*	*SD*	1	2	3	4	5	6	7	8

1. PO territoriality	2.43	1.18	—	.46**	-.33**	-.14*	-.29**	-.33**	-.29**	-.24**
2. PO traditional	4.11	1.60	.46**	—	-.20**	-.02n.s.	-.06n.s.	-.15*	-.12n.s.	-.17*
3. KS intent	4.20	0.55	-.33**	-.20**	—	.29**	.30**	.19**	.22**	.28**
4. KS behavior	5.21	0.90	-.14*	-.02n.s.	.29**	—	.42**	.14*	.16*	.26**
5. Affective org commitment	4.64	1.24	-.29**	-.06†	.30	.42**	—	.50**	.48**	.56**
6. Personal trust	5.08	1.18	-.33**	-.15*	.19**	.14*	.50**	—	.81**	.61**
7. Environment of trust	4.91	1.15	-.29**	-.12n.s.	.22**	.16*	.48**	.81**	—	.55**
8. Job satisfaction	43.20	10.00	-.24**	-.17*	.28**	.26**	.56**	.61**	.55**	—

Table Notes. n.s. not significant *$p < .05$ (1-tailed) **$p < .01$ (1-tailed).

Table 2
Hierarchical Multiple Regression Analysis Predicting Knowledge Sharing Intent

Step and variable	*b*	*t*	*SE*	*F*	R^2	ΔR^2	ΔF^2
Step 1	3.60**	22.61**	.159**	16.05**	.089**		
Affective org commitment	.132**	4.01**	.033**				
Step 2	4.07**	20.19**	.202**	15.27**	.157**	.068**	13.28**
Affective org commitment	.096*	2.89*	.033*				
Territorial PO	-.128**	-3.64**	.035**				

Note. N = 167.
*$p < .01$ (1-tailed). **$p < .001$ (1-tailed).

Second, a three-block hierarchical multiple regression was computed with knowledge sharing behavior as the dependent variable. The model of best fit consisted of affective organizational commitment and the moderation interaction term between territorial ownership and job satisfaction as predictors of knowledge sharing behavior. The model was statistically significant, $F(2, 164) = 19.49$, $p < .001$, and accounted for approximately 19% of the variance in

knowledge sharing intent (R^2 = .192). The regression statistics are in Table 3. Territorial PO did not significantly predict knowledge sharing behavior; therefore H1b was not supported. Beta coefficients for the moderation interaction term of job satisfaction was β = -.110, t = -2.023, p < .05. Job satisfaction significantly moderated territorial PO to knowledge sharing behavior; therefore H5b was supported relative to the criterion variable. Job satisfaction appeared to moderate the relationship between territorial ownership over knowledge and knowledge sharing behavior such that the relationship was less negative when job satisfaction was higher than when it is lower. Beta coefficients for the other the attitudinal variable moderators were: organizational commitment, β = .025, t = .343, p = .732, n.s; personal trust, β = -.011, t = -.153, p = .879, n.s; environment of trust, β = -.011, t = -.153, p = .879, n.s; and job satisfaction, β = .032, t = .435, p = .664, n.s. H2b, H3b, and H4b were not supported, neither affective organizational commitment, personal trust, nor environment of trust significantly moderated the criterion variable.

Table 3
Hierarchical Multiple Regression Analysis Predicting Knowledge Sharing Behavior

Step and variable	*b*	*t*	*SE*	*F*	R^2	ΔR^2	ΔF^2
Step 1	3.80**	15.21**	.250**	34.23**	.172**		
Affective org commitment	.303**	5.85**	.052**				
Step 2	3.70**	14.67**	.202**	19.49**	.192**	.02*	4.09*
Affective org commitment	.319**	6.14**	.052**				
Job Satisfaction x territorial PO (moderator)	-.110*	-2.02*	.054*				

Note. N = 167.

$^{*}p < .05$ (1-tailed). $^{**}p < .001$ (1-tailed).

Exploratory analyses were conducted to investigate effects of the traditional PO measure conceptualized by Brown and colleagues (2014b). First, linear regression was conducted to investigate the relationship of knowledge-based PO to knowledge sharing. The regression model of the traditional measure of PO, including both the main effects and the interaction term, was the predictive of knowledge sharing intent ($R^2 = .041$), $F(1,170) = 7.19$, $p < .01$. According to this model, higher levels of the traditional measure of PO predicted lower levels of knowledge sharing ($b = -.069$), $t(170) = -2.68$, $p < .01$. The regression model of the traditional measure of PO, including both the main effects and the interaction term, was not predictive of knowledge sharing behavior ($R^2 = 0$), $F(1,170) = .067$, $p = .79$.

Second, SPSS PROCESS macro (Hayes, 2017) was adopted to conduct further analysis to explore the mediating effect of the traditional measure of knowledge-based PO on the relationship between the territorial component of PO as conceptualized by Avey et al. (2009) (territorial ownership) and knowledge sharing intent. According to Baron and Kenny (1986), there are three criteria to establish the mediating effect: 1) the predictor significantly predicts the outcome, 2) the predictor significantly predicts the mediator, and 3) the mediator significantly predicts the outcome after controlling for the predictor. In the analysis, confidence levels were set at 95% with 5,000 bootstrapped samples. First, territorial ownership significantly predicted knowledge sharing intent (b = -.015, $p < .001$). Second, territorial ownership significantly predicted the traditional measure of PO (b = .625, $p < .001$). Finally, after controlling for the effect of territorial ownership, the traditional measure of PO significantly predicted knowledge sharing intent (b = -.022, $p < .001$). According to Baron and Kenny (1986), we can conclude there is mediation because the strength of the relationship between territorial PO and knowledge

sharing intent is reduced when the mediating variable is added. Without the traditional measure of PO, the beta for territorial PO to knowledge sharing intent is -.1389, (path c), $b = -.1389$, $p < .001$. When the mediator is added, it reduces path c', $b = -.1526$, $p < .001$. This drop from -.1389 to -.1526 indicates that additional variance is accounted for by the mediator (the traditional measure of PO) when it is added to the model.

Discussion

The findings of this study are consistent with the extant research on territoriality and sharing (Brown et al., 2005; Webster et al., 2008), suggesting a relationship between the territorial component of PO and knowledge sharing intent. While most of the existing literature on knowledge sharing has focused on enhancing knowledge sharing (e.g., Bock, 2005), the current study is unique in examining psychological impediments to knowledge sharing. Specifically, felt ownership over knowledge is supported in this study as a potential source of resistance to knowledge sharing, where higher levels of territorial PO are a motivational factor related to lower levels of knowledge sharing. However, territorial PO was found to be related to knowledge sharing *intention* but not knowledge sharing *behavior*. As discussed below, research regarding the discrepancy between intention and behavior helps explain these results.

Drawing from the correspondence principle, researchers have concluded that intention and behavior measures have higher consistency when the measures show a high degree of correspondence in terms of action(s) involved, the target of the action, the context, and the time of its occurrence (Ajzen & Fishbein, 1977). While all of the items in the intention measure used in this study are targeted at one's colleagues, certain items in the behavioral measure are targeted at the *community* or *virtual community*. The difference between the target of action in the measures offers one potential reason for the intention-behavior discrepancy in this study. The

theory of reasoned action (Fishbein & Ajzen, 1975) offers a second reason for this discrepancy. These authors state there is a discrepancy between intention and future behavior that can be explained by an individual's evaluation of future behavior as desirable to others. Knowledge-based territorial PO would understandably be affected by such an evaluation where one perceives sharing knowledge as desirable to others. Related to this, intention and behavioral measures are thought to have less discrepancy between them when an individual has a tangible vested interest in performing the behavior (Wong & Sheth, 1985). Therefore, lower perceived benefits (vested interests) related to sharing knowledge in the sample population, exacerbated, concealed, or caused by costs related to territorial feelings of ownership, could partially explain the discrepancy as well. Also from intention-behavior research, the more an individual has habitually engaged in a behavior, intention becomes less predictive of future behavior and past behavior is more predictive of future behavior (Bentler & Spencer, 1979). This suggests that the predictive capability of a behavioral measure is dependent upon how often the individual has actually engaged in the behavior. Thus, if knowledge sharing was not frequent enough in the sample population, such lower frequencies could have compromised the behavioral scale, but not necessarily compromise the scale of intent. The intention-behavior discrepancy research also suggests situational factors such as facilitating conditions that affect the feasibility of performing a behavior that may affect differences in behavior and intention measures (Leigh & Martin, 1981; Wong & Sheth, 1985).

Beyond the primary hypotheses, investigating attitudinal variables and the moderating relationship these variables may have on the PO to knowledge sharing relationship expands on the existing PO literature by addressing deficiencies outlined by Dawkins and colleagues (2015), specifically the lack of research on moderators that affect PO to workplace outcomes. While

results were mostly inconclusive, this study offers a theoretical foundation for future investigation into potentially latent moderating relationships not detected in analyses. The moderation may be explainable due to positive individual-level interactions participants experience with colleagues. Those positive interactions may contribute to feelings of general job satisfaction and leads to a motivation to reciprocate positive interactions with colleagues through knowledge sharing that counteracts potential territorial feelings of ownership felt toward said knowledge. Significant moderation of job satisfaction on the relationship between territorial PO and knowledge sharing behavior contributes to the empirical research on PO and job satisfaction (Avey et al., 2012; Bernhard & O'Driscoll, 2011; Chiu et al. 2007).

A second way this study expands on deficiencies in the existing PO literature is by offering a theoretical comparison of the two conceptualizations of PO as frameworks for understanding knowledge sharing. While relatively small in its effect, mediation analysis of the traditional measure of PO on the territorial component of PO (territorial PO) offers modest empirical evidence of overlap between the two conceptualizations. Perhaps this overlap can assist, in a small way, to the ongoing dialog between both camps of thought on the conceptualization of PO.

Due to the support for H1a and results of exploratory analyses, both higher levels of territorial PO and higher levels of the traditional measure of PO seem to be related to lower levels of knowledge sharing. As a result, this study provides circumstantial evidence that psychological ownership of nonphysical entities such as knowledge is easier to share (i.e., less of a psychological burden to give up) when both conceptualizations of PO are lower. Additionally, these results also seem to reject the notion that ownership of nonphysical entities such as knowledge is invulnerable to losing meaning to the self when assimilated into others through

sharing. Given that higher levels of the traditional measure of PO seem to be related to lower levels of sharing, these results may be partially explained by a target of ownership losing meaning to the self when shared. In other words, a desire to hold onto self-continuity could drive one to withhold knowledge. Furthermore, due to the efficacy and effectance components conceptualized within the traditional measure of PO, one would expect individuals to demonstrate their control over a target such as knowledge by using it (Rudmin & Berry, 1987), but not necessarily using knowledge through sharing. A final summed up observation on both measures of PO being related to lower levels of sharing is that territoriality is an important factor however one conceptualizes it.

Practical implications

While this study highlights more undesirable implications for individuals with higher levels of PO, there are strategies that may mitigate a resistance to share knowledge. First, Van Dyne and Pierce (2004) proposed individuals with particularly high levels of PO may feel more cooperative should managers stress an overall shared ownership rather than individual feelings of possession. Should employees with higher feelings of ownership toward specific knowledge be persuaded to view their expertise with a sense of shared ownership, they may be inclined to share more with coworkers. Second, the negative relationship between territorial PO and knowledge was lessened when employees were more satisfied with their jobs. To the extent that the relationship between job satisfaction and prosocial behaviors can be explained via social exchange theory (Cropanzano, & Mitchell, 2005) and knowledge sharing is predicted by norms of reciprocity (Kolekofski & Heminger, 2003), it is reasonable to suggest that managers try to enhance the satisfaction of their employees in order to increase the possibility of knowledge sharing.

Limitations and future research

While this study makes a number of contributions, some limitations should be acknowledged and directions for future research put forth. First, the modest sample size may have resulted in inadequate power to detect moderation. Researchers have documented difficulties in having power especially high enough to detect moderator effects (McClelland & Judd, 1993). Given the theoretical justification to test for the aforementioned attitudinal variables, future research could look to further investigate these suspected latent moderating effects on the PO to knowledge sharing relationship. Second, there are potential limitations in generalizing results from this study across organizational settings, across high knowledge worker job categories (e.g., from university professors to registered nurses), and between novice and expert knowledge workers. Third, this study examined only specific job attitudes as potential moderators of the relationship between PO and knowledge sharing. Future research may investigate other variables, such as individual differences, organizational norms, and culture (see Wang and Noe, 2010). Another area for future research related to PO would be to measure all five of the Avey et al. (2009) sub-scale components of PO against a traditional conceptualization from Brown and colleagues (2014b). Such a study could build off of mediation analysis of the traditional measure on the territorial component from Avey and colleagues (2009) for a better understanding of potential overlap and incongruity between the two conceptualizations.

Another limitation of this study is the reliance on self-reported data from participants in measuring all the variables, which results in the concern of common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). While artificially elevated measures of covariation (percept-percept inflation) as an additional consequence of reliance on self-reported data is also of concern, such concerns are lessened because not all relationships were significant (Crampton

& Wagner, 1994). Furthermore, certain steps were taken that could have helped control for common method biases. Two strategies were adopted from Podsakoff et al. (2003) to reduce concerns of common method bias. First, specific instructions were given to all measures. Second, the questionnaire assured anonymity. One source of common method bias, social desirability, was measured to assess how it may have affected the data. In testing for social desirability, the mean score for respondents out of a possible 13 was 8.84. This represents a high average score among respondents and indicates a potential for social desirability affecting responses to items of other measures. However, social desirability scores alone cannot be used to identify participants whose answers to questions should or should not be trusted. Responses to other measures were checked for correlation with social desirability scores greater confidence of social desirability affecting other variables. Bivariate correlation analysis showed weak correlations between social desirability and other variables with the exception of one moderate correlation between social desirability and affective organizational commitment ($r = .42$, $p < .01$). While there is no correlation coefficient that decisively indicates whether results are valid or not, these analyses help provide context of the potential influence of social desirability on responses.

A fifth limitation of this study was the focus on the individual knowledge sharing behavior instead of dynamics involved in knowledge transfer of a larger collective. Investigating knowledge sharing and different factors involved through a more macro lens of dynamics between colleagues, teams, and larger groups can enrich data by having participants verify their knowledge sharing through ratings of a colleague or team member. Cross-referencing ratings could also potentially lower the common knowledge effect (Gigone & Hastie, 1993). Furthermore, investigating dynamics of knowledge sharing in a dyad or group setting could provide a clearer understanding of how the territorial component of PO affects not just

knowledge sharing, but also knowledge seeking behaviors. The constant reciprocal aspects present in knowledge sharing and seeking behaviors in teams may ameliorate territorial motives on an individual's feeling that any discrete piece of knowledge is theirs due to, among other things, concepts described within social exchange theory.

Conclusion

The findings of the present study demonstrate that the territorial component of PO is related to levels of knowledge sharing, suggesting that territorial PO is a factor of concern when it comes to understanding psychological impediments to sharing knowledge among high knowledge workers. Researchers have demonstrated positive links between the traditional conceptualization of PO and employee attitudes in past studies (Van Dyne & Pierce, 2004). However, the territorial component developed by Avey and colleagues (2009) demonstrates a hurdle organizations need to address if they want to enrich their employees' repository of information from high knowledge workers. The effects of territorial PO on knowledge sharing behavior per se are inconclusive, instead intent to share knowledge is the only demonstrably predicted dependent variable. Inconsistencies between the measures of intent and behavior, individual differences concerning knowledge sharing, and situational factors all may partially help explain why the findings show a discrepancy from intent to behavior.

References

Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological bulletin*, *84*(5), 888.

Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of occupational and organizational psychology*, *63*(1), 1-18.

Alavi, M., & Leidner, D. E. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly*, 25(1), 107−136.

Andrews, K. M., & Delahaye, B. L. (2000). Influences on knowledge processes in organizational learning: The psychosocial filter. *Journal of Management studies*, *37*(6), 797-810.

Avey, J. B., Avolio, B. J., Crossley, C. D., & Luthans, F. (2009). Psychological ownership: Theoretical extensions, measurement and relation to work outcomes. *Journal of Organizational Behavior*, *30*(2), 173-191.

Avey, J. B., Wernsing, T. S., & Palanski, M. E. (2012). Exploring the process of ethical leadership: The mediating role of employee voice and psychological ownership. *Journal of Business Ethics*, *107*(1), 21-34.

Balzer, W. K., Kihm, J. A., Smith, P. C., Irwin, J. L., Bachiochi, P. D., Robie, C., Sinar, E. F., & Parra, L. F. (1997). Users' manual for the Job Descriptive Index (JDI; 1997 Revision) and the Job In General scales. Bowling Green, OH: Bowling Green State University.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of*

personality and social psychology, *51*(6), 1173.

Bartol, K. M., & Srivastava, A. (2002). Encouraging knowledge sharing: The role of organizational reward systems. *Journal of Leadership & Organizational Studies*, *9*(1), 64-76.

Beggan, J. K., & Brown, E. M. (1994). Association as a psychological justification for ownership. *Journal of Psychology, 128*, 365-380.

Bentler, P. M., & Speckart, G. (1979). Models of attitude–behavior relations. *Psychological review*, *86*(5), 452.

Bernhard, F., & O'Driscoll, M. P. (2011). Psychological ownership in small family-owned businesses: Leadership style and nonfamily-employees' work attitudes and behaviors. *Group and Organization Management*, 36, 345–384.

Bock, G. W., Zmud, R. W., Kim, Y. G., & Lee, J. N. (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organizational climate. *MIS quarterly*, 87-111.

Brown, G., Lawrence, T. B., & Robinson, S. L. (2005). Territoriality in organizations. *Academy of Management Review*, *30,* 577-594.

Brown, G., Crossley, C., & Robinson, S. L. (2014a). Psychological ownership, territorial behavior, and being perceived as a team contributor: The critical role of trust in the work environment. *Personnel Psychology*, *67*(2), 463-485.

Brown, G., Pierce, J.L. & Crossley C. (2014b). Toward an understanding of the development of ownership feelings. *Journal of Organizational Behavior*, 35, 318-338.

Cabrera, A., Collins, W. C., & Salgado, J. F. (2006). Determinants of individual engagement in knowledge sharing. *International Journal of Human Resource Management*, 17(2),

245−264.

Caldwell, B. (2005). Multi-team dynamics and distributed expertise in mission operations. *Aviation, space, and environmental medicine*, *76*(6), B145-B153

Caldwell, C., & Clapham, S. E. (2003). Organizational trustworthiness: An international perspective. *Journal of business ethics*, *47*(4), 349-364.

Caldwell, C., & Jeffries, F. L. (2001, October). Ethics, norms, dispositional trust, and context: Components of the missing link between trustworthiness and trust. In *Eighth Annual International Conference on Ethics in Business (De Paul University, Chicago, IL)*.

Cheng, E. W. (2001). SEM being more effective than multiple regression in parsimonious model testing for management development research. *Journal of management development*, *20*(7), 650-667.

Chih-Chien, W. (2004). The influence of ethical and self-interest concerns on knowledge sharing intentions among managers: An empirical study. *International Journal of Management*, *21*(3), 370.

Chi, N. W., & Han, T. S. (2008). Exploring the linkages between formal ownership and psychological ownership for the organization: The mediating role of organizational justice. *Journal of Occupational and Organizational Psychology*, 81, 691–711.

Chiu, W. C. K., Hui, C. H., & Lai, G. W. F. (2007). Psychological ownership and organizational optimism amid China's corporate transformation: Effects of an employee ownership scheme and a management dominated board. *International Journal of Human Resource Management*, 18, 303–320.

Crampton, S. M., & Wagner III, J. A. (1994). Percept-percept inflation in microorganizational research: An investigation of prevalence and effect. *Journal of applied psychology*, *79*(1),

67.

Coles, P., Cox, T., Mackey, C., & Richardson, S. (2006). The toxic terabyte-how datadumping threatens business efficiency. *IBM Global Technical Services*.

Connelly, C. E., Zweig, D., Webster, J., & Trougakos, J. P. (2012). Knowledge hiding in organizations. *Journal of Organizational Behavior*, *33*(1), 64-88.

Constant, D., Kiesler, S., & Sproull, L. (1994). What's mine is ours, or is it? A study of attitudes about information sharing. *Information Systems Research, 5,* 400-421.

Corritore, C. L., Kracher, B., & Wiedenbeck, S. (2003). On-line trust: concepts, evolving themes, a model. *International journal of human-computer studies*, *58*(6), 737-758.

Cram, F., & Paton, H. (1993). Personal possessions and self-identity: The experiences of elderly women in three residential settings. *Australian Journal on Aging, 12,* 19–24.

Cropanzano, R., & Mitchell, M. S. (2005). Social exchange theory: An interdisciplinary review. *Journal of management*, *31*(6), 874-900.

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of consulting psychology*, *24*(4), 349.

Darling, F. F. (1937). *A herd of red deer.* London: Oxford University Press.

Davenport, T. H., & Prusak, L. (1997). *Information ecology: Mastering the information and knowledge environment*. New York, NY: Oxford University Press.

Dawkins, S., Tian, A. W., Newman, A., & Martin, A. (2017). Psychological ownership: A review and research agenda. *Journal of Organizational Behavior*, *38*(2), 163-183.

De Vries, R. E., Van den Hooff, B., & de Ridder, J. A. (2006). Explaining knowledge sharing: The role of team communication styles, job satisfaction, and performance beliefs. *Communication research*, *33*(2), 115-135.

Dittmar, H. (1992). *The social psychology of material possessions: To have is to be*. Hemel Hempstead: Harvester Wheatsheaf.

Emich, K. J., & Wright, T. A. (2016). The 'I's in team. *Organizational Dynamics*, *1*(45), 2-10.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*.

Foss, N. J., & Pedersen, T. (2002). Transferring knowledge in MNCs: The role of sources of subsidiary knowledge and organizational context. *Journal of International Management*, *8*(1), 49-67.

Furby, L. (1976). The socialization of possession and ownership among children in three cultural groups: Israeli kibbutz, Israeli city, and American. *Piagetian research: Compilation and commentary*, *8*, 95-127.

Furby, L. (1978). Possessions: Toward a theory of their meaning and function throughout the life cycle. *Life-span development and behavior*.

Furby, L. (1991). Understanding the psychology of possession and ownership: A personal memoir and an appraisal of our progress. *Journal of Social Behavior and Personality, 6,* 457–463.

Gantz, J., & Reinsel, D. (2010). The digital universe decade-are you ready. *IDC White Paper*, 1-16.

Gefen, D., Straub, D., & Boudreau, M. C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the association for information systems*, *4*(1), 7.

Gigone, D., & Hastie, R. (1993). The common knowledge effect: Information sharing and group judgment. *Journal of Personality and Social Psychology, 65*, 959–974.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (1998). *Multivariate data analysis* (Vol. 5, No. 3, pp. 207-219). Upper Saddle River, NJ: Prentice hall.

Han, T. S., Chiang, H. H., & Chang, A. (2010). Employee participation in decision making, psychological ownership and knowledge sharing: mediating role of organizational commitment in Taiwanese high-tech organizations. *The International Journal of Human Resource Management*, *21*(12), 2218-2233.

Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Publications.

Higgins, E. T. (1997). Beyond pleasure and pain. *American psychologist*, *52*(12), 1280.

Higgins, E. T. (1998). Promotion and prevention: Regulatory focus as a motivational principle. *Advances in experimental social psychology*, *30*, 1-46.

Highhouse, S., & Becker, A. S. (1993). Facet measures and global job satisfaction. *Journal of Business and psychology*, *8*(1), 117-127.

Jehn, K. A., Northcraft, G. B., & Neale, M. A. (1999). Why differences make a difference: A field study of diversity, conflict and performance in workgroups. *Administrative science quarterly*, *44*(4), 741-763.

Jex, S. M., & Britt, T. W. (2014). *Organizational psychology: A scientist-practitioner approach* (p. 111). John Wiley & Sons.

Kankanhalli, A., Tan, B. C., & Wei, K. K. (2005). Contributing knowledge to electronic knowledge repositories: an empirical investigation. *MIS quarterly*, 113-143.

Kluger, A. N., Stephan, E., Ganzach, Y., & Hershkovitz, M. (2004). The effect of regulatory focus on the shape of probability-weighting function: Evidence from a cross-modality matching method. *Organizational Behavior and Human Decision Processes*, *95*(1), 20-

39.

Knapp, J. R., Smith, B. R., & Sprinkle, T. A. (2014). Clarifying the relational ties of organizational belonging: Understanding the roles of perceived insider status, psychological ownership, and organizational identification. *Journal of Leadership & Organizational Studies*, *21*(3), 273-285.

Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization science*, *3*(3), 383-397.

Kolekofski, K. E., & Heminger, A. R. (2003). Beliefs and attitudes affecting intentions to share information in an organizational setting. *Information & management*, *40*(6), 521-532.

Konstantinou, E., & Fincham, R. (2011). Not sharing but trading: Applying a Maussian exchange framework to knowledge management. *Human Relations*, *64*(6), 823-842.

Leigh, J. H., & Martin, C. R. (1981). A review of situational influence paradigms and research. *Review of marketing*, 57-74.

Lin, C. P. (2007). To share or not to share: modeling knowledge sharing using exchange ideology as a moderator. *Personnel Review*, *36*(3), 457-475.

Lin, H. F. (2007a). Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science*, 33(2), 135−149.

Lin, H. F. (2007b). Knowledge sharing and firm innovation capability: An empirical study. International *Journal of Manpower*, 28(3/4), 315−332.

Liu, J., Wang, H., Hui, C., & Lee, C. (2012). Psychological ownership: How having control matters. *Journal of Management Studies*, *49*(5), 869-895.

Locke, E. A. (1976). The nature and causes of job satısfaction. *Handbook of Industrial and Organizational Psvchology. Chicago*, *45*, 1297-1349.

Mathieu, J. E., & Zajac, D. M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological bulletin*, *108*(2), 171.

Mayhew, M. G., Ashkanasy, N. M., Bramble, T., & Gardner, J. (2007). A study of the antecedents and consequences of psychological ownership in organizational settings. *The Journal of social psychology*, *147*(5), 477-500.

McAllister, D. J. (1995). Affect-and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of management journal*, *38*(1), 24-59.

McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological bulletin*, *114*(2), 376.

Majchrzak, A., Jarvenpaa, S. L., & Hollingshead, A. B. (2007). Coordinating expertise among emergent groups responding to disasters. *Organization science*, *18*(1), 147-161.

Neff, J. J., Fulk, J., & Yuan, Y. C. (2014). Not in the mood? Affective state and transactive communication. *Journal of Communication*, *64*(5), 785-805.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization science*, *5*(1), 14-37.

Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford university press.

Pascoe, C., Ali, I. M., & Warne, L. (2002). Yet another role for job satisfaction and work motivation–Enabler of knowledge creation and knowledge sharing. In *Proceedings of the Informing Science+ IT Education Conference* (pp. 1239-1248).

Peltokorpi, V. (2008). Transactive memory systems. *Review of General Psychology*, *12*(4), 378. Management, 8(1), 49−67.

Pearce, J. L., Branyiczki, I., & Bigley, G. A. (2000). Insufficient bureaucracy: Trust and commitment in particularistic organizations. *Organization Science*, *11*(2), 148-162.

Pierce, J. L., & Jussila, I. (2010). Collective psychological ownership within the work and organizational context: Construct introduction and elaboration. *Journal of Organizational Behavior*, *31*(6), 810-834.

Pierce, J. L., Kostova, T., & Dirks, K.T. (2001). Toward a theory of psychological ownership in organizations. *Academy of Management Review, 26,* 298-310.

Pierce, J. L., Kostova, T., & Dirks, K. T. (2003). The state of psychological ownership: Integrating and extending a century of research. *Review of general psychology*, *7*(1), 84.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of applied psychology*, *88*(5), 879.

Ramos, H. M., Man, T. W. Y., Mustafa, M., & Ng, Z. Z. (2014). Psychological ownership in small family firms: Family and non-family employees' work attitudes and behaviours. *Journal of Family Business Strategy*, *5*(3), 300-311.

Reinhardt, W., Schmidt, B., Sloep, P., & Drachsler, H. (2011). Knowledge worker roles and actions—results of two empirical studies. Knowledge and Process Management, 18(3), 150-174.

Ren, Y., Carley, K. M., & Argote, L. (2006). The contingent effects of transactive memory: When is it more beneficial to know what others know? *Management Science*, 52, 671–682.

Rudmin, F. W., & Berry, J. W. (1987). Semantics of ownership: A free-recall study of property. *Psychological Record, 37,* 257–268.

Schepers, P., & van den Berg, P. T. (2007). Social factors of work-environment creativity. *Journal of Business and Psychology*, 21(3), 407−428.

Sieger, P., Bernhard, F., & Frey, U. (2011). Affective commitment and job satisfaction among non-family employees: Investigating the roles of justice perceptions and psychological ownership. *Journal of Family Business Strategy*, 2, 78–89.

Tabachnick, B. G., & Fidell, L. S. (2001). Using multivariate analysis.

Usoro, A., Sharratt, M. W., Tsui, E., & Shekhar, S. (2007). Trust as an antecedent to knowledge sharing in virtual communities of practice. *Knowledge Management Research & Practice*, *5*(3), 199-212.

Van Dyne, L., & Pierce, J. L. (2004). Psychological ownership and feelings of possession: Three field studies predicting employee attitudes and organizational behavior. *Journal of Organizational Behavior,* 25, 439-460.

vd van den Hooff, B., & Hendrix, L. (2005). Eagerness and willingness to share: The relevance of different attitudes towards knowledge sharing. *OKLC*.

Wang, S., & Noe, R. A. (2010). Knowledge sharing: A review and directions for future research. *Human Resource Management Review*, *20*(2), 115-131.

Wasko, M. M., & Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS quarterly*, 35-57.

Webster, J., Brown, G., Zweig, D., Connelly, C. E., Brodt, S., & Sitkin, S. (2008). Beyond knowledge sharing: Withholding knowledge at work. In *Research in personnel and human resources management* (pp. 1-37). Emerald Group Publishing Limited.

White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review, 66,* 297–330.

Willem, A., & Scarbrough, H. (2006). Social capital and political bias in knowledge sharing: An exploratory study. *Human relations*, *59*(10), 1343-1370.

Wilson Edward, O. (1975). Sociobiology: the new synthesis. *Cambridge: The Balknap Pr. of Harvard Univ. Pr*, *8.*

Wittenbaum, G. M., Hollingshead, A. B., & Botero, I. C. (2004). From cooperative to motivated information sharing in groups: Moving beyond the hidden profile paradigm. *Communication Monographs*, *71*(3), 286-310.

Wong, J. K., & Sheth, J. N. (1985). Explaining intention-behavior discrepancy--a paradigm. *ACR North American Advances*.

Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and psychological measurement*, *73*(6), 913-934.

Yoo, W. S., Suh, K. S., & Lee, M. B. (2002). Exploring the factors enhancing member participation in virtual communities. *Journal of Global Information Management (JGIM)*, *10*(3), 55-71.

Zander, U., & Kogut, B. (1995). Knowledge and the speed of the transfer and imitation of organizational capabilities: An empirical test. *Organization science*, *6*(1), 76-92.

Appendices

Demographics

1. To which department are you a faculty member?
    a. Psychology, …
2. What is your rank?
    a. Instructor, Assistant Professor, Associate Professor, Tenured Professor
3. What is your highest educational level?
    a. Associate degree, Bachelor's degree, Master's degree, Professional degree, Doctorate degree
4. How many years have you been an instructor?
    a. 1-3, 4-6, 7-9, 10 or more
5. How many years have you been an instructor at UMD?
    a. 1-3, 4-6, 7-9, 10 or more
6. On average, how many courses do you teach per semester
    a. 1, 2, 3, 4 or more
7. What percentage would you designate to the following?
    a. Teaching 0, 20, 40, 50, 60, 80, 100
    b. Research 0, 20, 40, 50, 60, 80, 100
    c. Service 0, 20, 40, 50, 60, 80, 100
8. Race
    a. White, Hispanic or Latino, Black or African American, Native American or American Indian, Asian / Pacific Islander, Other

9. Age
    a. 18-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75 or older
10. Sex
    a. M, F, Other, Prefer not to answer

Psychological Ownership Questionnaire (POQ) – Territoriality

Instructions: Below are statements that describe how you may think about yourself right now. Use the following scale to indicate your level of agreement or disagreement with each statement.

1 = Strongly Disagree; 2 = Disagree; 3 = Slightly Disagree; 4 = Neither Agree nor Disagree; 5 = Slightly Agree; 6 = Agree: 7 = Strongly Agree

1. I feel I need to protect my ideas from being used by others in my institution.
2. I feel that people I work with in my organization should not invade my workspace.
3. I feel I need to protect my property from being used by others in this institution.
4. I feel I have to tell colleagues in my institution to 'back off' from projects that are mine.

Measurement of Psychological Ownership – Traditional

Instructions: Think about the knowledge you have and use in teaching your courses, and the experiences and feelings associated with the statement "this is my knowledge!" The following questions deal with the '*sense of ownership*' that you feel toward the knowledge you have in teaching your courses. Indicate the degree to which you personally *agree* or *disagree* with the following statements.

1 = Strongly Disagree; 2 = Disagree; 3 = Slightly Disagree; 4 = Neither Agree nor Disagree; 5 = Slightly Agree; 6 = Agree: 7 = Strongly Agree

1. I sense that this knowledge is MINE.
2. I feel a very high degree of personal ownership for my course materials.

3. I sense that this is MY knowledge.

4. I sense that the coursework prep I do as part of my job is MINE.

5. I feel a very high degree of personal ownership for the teaching related work that I do.

6. The teaching related work I do at this institution is MINE.

Knowledge sharing Intention

Instructions: Here, *knowledge* means *the individual's know-how or something which is helpful in teaching ones' courses*. *Knowledge sharing* means *providing or transferring one's knowledge to others*. Knowledge sharing is possible through various methods such as formal and/or informal meetings and information systems. Please respond in terms of your level of agreement with the following statements.

1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Agree; 5 = Strongly Agree

Intention to Share Knowledge Scale

Intention to share explicit knowledge

1. I will share my course materials and syllabi with colleagues more frequently.

2. I will always provide my lesson plans, course resources, and teaching practices for colleagues of my institution.

Intention to share implicit knowledge

1. I intend to share my experience or know-how from work with other colleagues.

2. I will always provide my know-how at the request of other colleagues.

3. I will try to share my expertise from my education or training with other colleagues in an effective way.

Knowledge Sharing Behavior

Instructions: Here, *knowledge* means *the individual's know-how or something which is helpful in teaching ones' courses*. *Knowledge sharing* means *providing or transferring one's knowledge to others*. Knowledge sharing is possible through various methods such as formal and/or informal meetings and information systems. Please respond in terms of your level of agreement with the following statements.

1 = Strongly Disagree; 2 = Disagree; 3 = Slightly Disagree; 4 = Neither Agree nor Disagree; 5 = Slightly Agree; 6 = Agree: 7 = Strongly Agree

1. I frequently share my knowledge with colleagues in the institution.

2. I am one of the more active contributors within the institution.

3. Colleagues find my knowledge-sharing contributions to be useful.

4. My contributions to the institution enable others to develop new knowledge.

5. I am a knowledgeable contributor to the virtual community.

6. The knowledge I share with the community in my institution has a positive impact on it.

7. Overall, I feel the frequency and quality of my knowledge-sharing efforts are of great value to the institution.

Affective Organizational Commitment

Instructions: Please indicate your level of agreement with the following statements:

1 = Strongly Disagree; 2 = Disagree; 3 = Slightly Disagree; 4 = Neither Agree nor Disagree; 5 = Slightly Agree; 6 = Agree: 7 = Strongly Agree

1. I would be very happy to spend the rest of my career with this institution.

2. I enjoy discussing my institution with people outside it.

3. I really feel as if this institution's problems are my own.

4. I think that I could easily become attached to another institution as I am to this one.

5. I do not feel like ‘ part of the family’ at my institution.

6. I do not feel ‘ emotionally attached’ to this institution.

7. this institution has a great deal of personal meaning to me.

8. I do not feel a strong sense of belonging to my institution.

Personal Trust

Instructions: Please indicate your level of agreement with the following statements:

1 = Strongly Disagree; 2 = Disagree; 3 = Slightly Disagree; 4 = Neither Agree nor Disagree; 5 = Slightly Agree; 6 = Agree: 7 = Strongly Agree

1. My colleagues are truthful in their dealings with me.

2. My colleagues appreciate my good work.

3. I can trust my colleagues to do their jobs well.

4. My colleagues will not disclose personal information.

5. My colleagues are considerate of my interests.

6. My colleagues display ethical behavior.

7. My colleagues are reliable.

Environment of Trust

Instructions: Please indicate your level of agreement with the following statements:

1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Agree; 5 = Strongly Agree

1. I can rely on those I work with in this group.

2. There is no "team spirit" in my work group.

3.We have confidence in one another in this work group.

4. Colleagues of my work group show a great deal of integrity.

5. We are usually considerate of one another's feelings in this work group.

Job Satisfaction

Instructions: Think of your job in general. All in all, what is it like most of the time? In the blank beside each word or phrase be- low, write

Y for "Yes" if it describes your job

N for "No" if it does not describe it

? for "?" if you cannot decide

__Pleasant

__ Bad

__ Great

__ Waste of time

__ Good

__ Undesirable

__ Worthwhile

__ Worse than most

__ Acceptable

__ Superior

__ Better than most

__ Disagreeable

__ Makes me content

__ Inadequate

__ Excellent

__ Rotten

__ Enjoyable

__ Poor

Marlowe-Crowne Social Desirability Scale 13-Item Short Form

True or False

1. It is sometimes hard for me to go on with my work if I am not encouraged

2. I sometimes feel resentful when I don't get my own way.

3. On a few occasions, I have given up doing something because I thought too little of my ability.

4. There have been times when I felt like rebelling against people in authority even though I knew they were right.

5. No matter who I'm talking to, I'm always a good listener.

6. There have been occasions when I took advantage of someone.

7. I'm always willing to admit it when I make a mistake.

8. I sometimes try to get even, rather than forgive and forget.

9. I am always courteous, even to people who are disagreeable.

10. I have never been irked when people expressed ideas very different from my own.

11. There have been times when I was quite jealous of the good fortune of others.

12. I am sometimes irritated by people who ask favors of me.

13. I have never deliberately said something that hurt someone's feelings.